

CLAIMS:

1. An explosively actuated tool for driving a fastener into a substrate, said tool having a barrel, a piston displaceable in the barrel on firing of the tool to drive a fastener from the forward end of the barrel into the substrate upon firing of a charge, and a firing mechanism including a firing pin, and a rotary sear pivotal between a position in which the sear entrains the firing pin and a position in which the sear is released whereby the firing pin is driven towards the charge to thereby fire the charge, wherein the rotary sear is carried by a cocking rod, and the cocking rod and the sear carried thereby is subject to a rotational and axial bias by a spring anchored at one end relative to the cocking rod and at the other end to a mounting, the mounting being rotatable to apply torsional loading to the spring and being lockable to a housing of the cocking rod in an angular orientation in which torsional loading is maintained in the spring.
2. A tool according to claim 1, wherein the spring is a compression coil spring and the mounting is in the form of a hollow cap within which a rear end portion of the spring is engaged, the cap being formed for co-operation with a tool to facilitate its rotation in order to apply the required torsional loading to the spring.
3. A tool according to claim 2, wherein the cap is of cylindrical form and is locatable into a cylindrical passage formed in the housing, the cap being releasably locked within the passage in a predetermined angular orientation to provide the required torsional loading.
4. A cap according to claim 3, wherein the cap is locked within the passage in a selected one of two or more different predetermined angular orientations.
5. A cap according to claim 3, wherein with the spring anchored at a front end relative to the cocking rod and at a rear end to the cap, the cap requires rotation through at least approximately 180° for insertion into the passage in the required angular orientation.
6. A cap according to claim 5, wherein the front end of the spring is anchored relative

- 10 -

to the cocking rod by engagement with the rotary sear.

7. A tool according to claim 3, wherein the cocking rod extends rearwardly beyond the sear and the forward end part of the spring is fitted over the extension, the extension
5 providing axial support for a substantial part of the spring.
8. A method of assembling an explosively actuated tool for driving a fastener into a substrate, said tool having a barrel, a piston displaceable in the barrel on firing of the tool to drive a fastener from the forward end of the barrel into the substrate upon firing of a
10 charge, and a firing mechanism including a firing pin, and a rotary sear pivotal between a position in which the sear entrains the firing pin and a position in which the sear is released whereby the firing pin is driven towards the charge to thereby fire the charge, the rotary sear being carried by a cocking rod for axial and rotational movement therewith in a housing for the firing pin and cocking rod, wherein said method includes:
- 15 anchoring a forward end of a compression coil spring to the structure formed by the cocking rod and rotary sear carried thereby;
anchoring a rear end of the spring to a mounting;
rotating the mounting about the axis of the coil spring to apply a torsional loading to the spring; and
- 20 locking the mounting to the housing in a predetermined angular orientation in which torsional loading is maintained in the spring, the spring thereby providing a forwards axial bias to the cocking rod and sear, and a rotational bias to the cocking rod and sear in a sense to pivot the sear into engagement with the firing pin.
- 25 9. A method according to claim 8, wherein the cocking rod extends rearwardly of the rotary sear and the mounting is in the form of a hollow cap of cylindrical form, said method including:
- mounting a forward portion of the coil spring over the rearwardly projecting part of the cocking rod; and
- 30 engaging the rear end of the spring within the hollow interior of the cap.

- 11 -

10. A method according to claim 9, wherein the forward end of the spring is engaged with the rotary sear to thereby anchor that end to said structure.

11. A method according to claim 9, wherein the cap is manually rotated to provide
5 torsional loading to the spring by application of a hand tool to the cap.

12. A method according to claim 11, wherein the cap is locked to the housing in a selected one of two or more different predetermined angular orientations of the cap whereby to permit adjustment to provide the required torque characteristics to account for
10 differences in spring characteristics between different springs arising as a result of manufacturing tolerances.

13. An explosively actuated tool for driving a fastener into a substrate, said tool having a barrel, a piston displaceable in the barrel on firing of the tool to drive a fastener from the
15 forward end of the barrel into the substrate upon firing of a charge, and a firing mechanism including a firing pin, and a rotary sear pivotal between a position in which the sear entrains the firing pin and a position in which the sear is released whereby the firing pin is driven towards the charge to thereby fire the charge, wherein the rotary sear is carried by a
20 cocking rod, and the cocking rod and the sear carried thereby is subject to a rotational and axial bias by a spring anchored at one end to the structure formed by the cocking rod and sear and at the other end to a mounting, the mounting being rotated during assembly of the firing mechanism to apply torsional loading to the spring and then being locked to a housing of the cocking rod and firing pin in an angular orientation in which torsional loading is maintained in the spring.

25

14. A firing mechanism of an explosively actuated tool for driving a fastener into a substrate, said mechanism including a cocking rod with a sear for entraining a firing pin with the firing pin being releasable on cocking by rotation of the sear, the cocking rod and sear forming a structure subject to an axial and rotational bias by a coil spring anchored at
30 one end to the structure and at the opposite end to a mounting which during assembly of the mechanism is rotated to apply torsional loading to the spring and is then locked into a

- 12 -

housing of the mechanism in an angular orientation in which torsional loading is maintained in the spring.